



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,765	11/02/2001	Eui-Hyeok Yang	06618-720001 / CIT-3325	7381

20985 7590 07/03/2003

FISH & RICHARDSON, PC
4350 LA JOLLA VILLAGE DRIVE
SUITE 500
SAN DIEGO, CA 92122

EXAMINER

MITCHELL, JAMES M

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/005,765

Applicant(s)

YANG ET AL.

Examiner

James Mitchell

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 12-20 is/are allowed.
- 6) ☒ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) 6-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 0201 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Harsh ("Flip-Chip Assembly for Si-Based RF MEMS").

Harsh (Fig 2, 4) discloses a method comprising causing a semiconductor carrier wafer (not labeled; Page 274, RT Col. Par.2) to be fabricated to include a membrane ("MEMS Device") on one side of said carrier wafer, causing said membrane on said carrier wafer to bond to a surface of different, device wafer by a plurality of joints ("indium bumps" & "epoxy"; Fig 4 step 2, 4) causing said joints and said device wafer to be isolated from exposure to etching chemicals and causing said carrier wafer to be selectively etched away to expose said membrane and to leave said membrane on said device wafer (Fig 4, Step 4, 5); causing a first etching process to be performed to remove at least a portion of said carrier and causing a second etching process to be performed to remove said portion of an insulator layer (SIO.sub.2); wherein the insulator layer is sandwiched between said carrier and said membrane.

With respect to first etching the carrier to expose an insulator layer and secondly removing the insulator layer, it would have been to choose the particular sequence, because it is well established that, in a well known process, the order of performing process steps is prima facie obvious in the absence of new or unexpected results. Ex parte Rubin 128 USPQ (PO BdPatApp 1959).

Claim Rejection - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harsh as applied to claim 1 and further in combination with Bowers et al. (US 20020071169).

Harsh does not appear to disclose a wet and plasma etching steps, but Bowers utilizes a wet and plasma etching steps (Par.0053).

It would have been obvious to one of ordinary skill in the art to incorporate a plasma etch step with the wet step ("HF") of Harsh as equivalent step to remove the oxide layer as required by Harsh (Fig 4).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harsh and Bowers as applied 3 and further in combination with Aigner et al. (US 6,357,299).

Neither Harsh nor Bowers appear to disclose that the wet etch is a KOH solution or tetramethylammonium hydroxide.

However Harsh and Bowers discloses the same invention except that the wet etch is HF instead of a KOH solution, Aigner shows that HF and KOH are an equivalent processes known in the art known in the art. Therefore, because these two etchants are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute KOH for a HF etch.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harsh as applied to claim 1.

With respect to claim 11, Harsh disclose the claimed invention except for causing a second carrier wafer to be fabricated to include a second membrane on one side to said second carrier to bond to said device wafer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to cause a second carrier wafer to be fabricated to include a second membrane on one side to said second carrier to bond to said device wafer, because it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v Bemis, 193 USPQ 8 (CA7 1977), see also In re Harza, 124 USPQ 378 (CCPA 1960).

Allowable Subject Matter

Claims 6-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12-20 are allowable.


The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make obvious hermetically bonding a first a set of indium bumps on a semiconductor carrier wafer with a second set of indium bumps on a device wafer including all the limitations the independent claims.

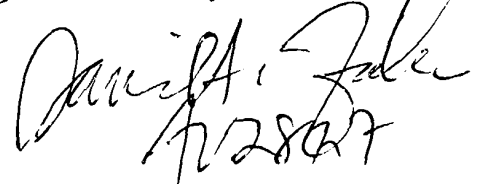
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


jmm
June 29, 2003

David A. Zarneke

A2827